Claims

1. Device (1) for blending a binder component (A) and a hardener component (B) to a pasty or liquid material to be mixed, in particular for poducing a ready-made filler for the filling of surfaces of vehicle bodies, whereby the device has store tanks (3a, 3b) for the separate storage of the components (A, B) and at least one mixing chamber (14) which is connected by separate supplying channels (13a, 13b) with the single store tanks (3a, 3b), whereby the mixing chamber (14) has at least one delivery opening (21) for the material to be mixed and whereby a metering device is provided for the delivery of the components (A, b) from the store tanks (3a, 3b) through the mixing chamber (14) to the delivery opening (21),
characterized in
that the device (1) for the hardener component (B) has at least one store tank (3b) which is connected with the mixing chamber (14) by at least one, preferably by at least one or two separate supplying channels (13b), whereby the supply of the binder component (A) and of the hardener component (B) to the mixing chamber (14) takes place by means of control devices in such a manner that the hardener component (B) is supplied to the mixing chamber (14) with a slight advance with respect to the binder component (A).

2. Device according to claim 1,
characterized in
that the device (1) for the hardener component (B) has at least two store tanks (3b) which are connected with the mixing chamber (14) by separate supplying channels (13b).

3. Device according to any of the claims 1 or 2,
characterized in

that the metering device is configured in such a way that with a bubble free mixing of the components (A, B) the mixing ratio V_B:V_S from the volume flow V_B of the hardener component (B) supplied to the mixing chamber and the sum V_S of the volume flow V_B and the volume flow V_A of the binder component (A) supplied to the mixing chamber is in the range of the 1% to 4%, in particular between 1,5% and 3% and preferably approximately 2%.

4. Device according to any of the claims 1 to 3,
characterized in
that a thixotrope binder component (A) is placed in the store tank (3a) for the binder component (A) and that the device (1) has a device placed before the mixing chamber (14) for increasing the flowability of the binder component (A).

5. Device according to any of the claims 1 to 4,
characterized in
that the device for increasing the flowability has at least one element placed in the supplying channel (13a) for the binder component (A) which can be driven in such a way that kinetic energy is brought into the binder component (A).

6. Device according to any of the claims 1 to 5,
characterized in
that the store tanks (3a, 3b) are placed on a base station (2), that the mixing chamber (14) is formed in a mixing head (15) which can be detachably connected with the base station (2) and that the supplying channels (13a, 13b) are guided and the mixing head (15) configured in such a manner that after the mixing process is terminated and the mixing head (15) separated from the base station (2) all the rests of the material to be mixed remain in the mixing head (15).

7. Device according to any of the claims 1 to 6,
characterized in
that the supplying channel (3a) for the binder component (A) has an inner and an outer limiting wall which are spaced from each other by an annular gap and are movable with respect to each other in circumferential direction of the annular gap, whereby at least one of these limiting walls as element for bringing in the kinetic energy has a projecting part (22).

8. Device according to any of the claims 1 to 7,
characterized in
that at least the outer limiting wall is made of a transparent material and that the hardener component (B) differs from the binder component (A) preferably by its colour.

9. Device according to any of the claims 1 to 8,
characterized in
that the elements for bringing in kinetic energy can be placed in several levels spaced from each other in direction of the rotational axis of the motion of revolution by gaps.

10. Device according to any of the claims 1 to 9,
characterized in
that the planes of extension of at least two levels with elements for bringing in kinetic energy are tilted to each other.

11. Device according to any of the claims 1 to 10,
characterized in
that the metering device is configured in such a manner that for a bubble free hardener component (B) the quantity of hardener component (B) supplied to the mixing chamber (14) is drawn

approximately in equal quantities from the single store tanks (eb) for the hardener component (B).

12. Device according to any of the claims 1 to 11,
characterized in
that the store tank (3a) for the binder component (A) is preferably placed approximately in the middle between the store tanks (3b) for the hardener component (B).

13. Device according to any of the claims 1 to 12,
characterized in
that the store tanks (3a, 3b) are configured respectively as cartridges with a sliding bottom (5a, 5b) displaceable in a hollow cylindrical housing section (4a, 4b), that respectively a seat with an abutment (6a, 6b) for the hollow cylindrical housing section (4a, 4b) is provided on the base station (2) for each cartridge and that a pressure piston (7a, 7b) is positioned adjustable respectively to the abutment (6a, 6b) with which a pressure can be charged onto the sliding bottom (5a, 5b) of the concerned cartridge for pressing out the component (A, B) which is therein.

14. Device according to any of the claims 1 to 13,
characterized in
that the pressure pistons (7a, 7b) are connected by a bridge (9) with each other preferably at their end areas away from the sliding bottoms (5a, 5b) and that the bridge (9) is movable with respect to the abutments (6a, 6b) by means of an actuator.

15. Device according to any of the claims 1 to 14,
characterized in
that the actuator has a drive shaft which is connected with the bridge (9) for displacing the bridge (9) over a spindle nut (10) placed on a threaded spindle (11).

16. Device according to any of the claims 1 to 15,
characterized in
that the actuator has an electric motor (12) and that an accumulator is preferably provided for the current supply of the electric motor (12).

17. Device according to any of the claims 1 to 16,
characterized in
that the actuator has a pneumatic or a hydraulic working cylinder and/or a pneumatic or hydraulic motor.

18. Device according to any of the claims 1 to 17,
characterized in
that the drive shaft can also be drivingly connected with a handwheel.

19. Device according to any of the claims 1 to 18,
characterized in
that the drive shaft is drivingly connected with at least one mixing element placed in the mixing chamber (14).

20. Device according to any of the claims 1 to 19,
characterized in
that the mixing chamber (14) is formed in the type of an annular gap between an inner and an outer chamber wall, whereby the chamber walls are positioned rotatable to each other about a rotational axis and that the mixing elements are teeth (23, 24) placed on the sides of the chamber walls which are turned to each other, teeth to which tooth spaces are adjacent in circumferential direction of the mixing chamber (14) and that the teeth during the motion of rotation rotate past each other by being offset to each other in direction of the rotational axis in

such a manner that the components (A, B) are mixed with each other by division.

21. Device according to any of the claims 1 to 20,
characterized in
that the inner chamber wall and the outer chamber wall are positioned twistable to each other with an axial backlash, that the teeth (24) of the inner chamber wall are offset to the teeth (23) of the outer chamber wall in axial direction in such a manner that front side faces (30, 31) turned to each other, orientated in axial direction, of at least one tooth (24) of the inner chamber wall and of at least one tooth of the outer chamber wall can be positioned against each other by a force acting in axial direction between the inner chamber wall and the outer chamber wall and that these front side faces (30, 31) are inclined with reference to a surface plane placed normal to the rotational axis with an angle (α) such that the front side faces (30, 31) glide on each other during the mixing process without material being removed from the teeth (23, 24) into the material to be mixed (C).

22. Device according to any of the claims 1 to 21,
characterized in
that additionally to the first electric motor (12) a second electric motor (25) is provided which is drivingly connected with at least one mixing element and that the electric motors (12, 25) are preferably connected with a control device which is configured in such a way that the first electric motor is switched on when switching on or with a time delay after the second electric motor (25) has been switched on.

23. Device according to any of the claims 1 to 22,
characterized in

that a receiving eement (32) for the material to be mixed (C) is placed below the delivery opening (21), this element (32) being movable against a restoring force from a position of rest to a working position in such a manner that it is moved away from the delivery opening (21) when charging with the material to be mixed (C) under the influence of its gravity.

24. Device according to claim 23,
characterized in
that the receiving element (32) is connected with the mixing head (15) swivellable from the position of rest into the working positin.

25. Device according to any of the claims 1 to 24,
characterized in
that the metering device can be triggered by a switch clock for mixing a predetermined quantity of the material to be mixed (C).

26. Device according to any of the claims 1 to 25,
characterized in
that the inner chamber wall is placed on a rotor part (19) and the outer chamber wall on a stator part (16) and that the rotor part (19) is positioned rotatable in the stator part (16) about a rotational axis by means of a rotation bearing and is fixed in axial direction with respect to the stator part (16) by means of a supporting bearing.

27. Device according to any of the claims 1 to 26,
characterized in
that the supporting bearing has a rotary table (35), rotatable about the rotational axis, on which the rotor part (19) comes to bear with a front side in position of use.

28. Device according to any of the claims 1 to 27,
characterized in
that a device (90) for the preliminary injection of a small quantity of hardener comonent (B) is connected with one of the two supplying channels (13a; 13b) for the hardener component (B), this device consisting of a clyinder (91) with one piston placed in its inner space (91a) driven by compressed air or differently, whereby the piston (92) is controllable so that during the supply of a small quantity of hardener comoennt (B) the supplying channel (13a; 13b) for the supply of further quantities of hardener component (B) is closed and after termination of the supply of a small quantity of hardener component (B) the piston (92) introduced in the supplying channel (13a; 13b) is withdrawn from the supplying channel (13a; 13b) and thus the further supply of hardener component (A) into the mixing chamber (14) is released.

29. Device according to any of the claims 1 to 28,
characterized in
that each store tank (3a, 3b) for the binder component (A) and the hardener component (B) for centering the outlet opening (61) configured in the tank bottom (60) for the container content to the inlet openings of the supplying channels (13a, 13b) in or on its bottom plate (60') has ring-shaped or partially ring-shaped outwards orientated beads (65) which engage into corresponding groove shaped recesses (75) in the abutment (6a, 6b) configured in the type of a carrier plate for the store tank (3a, 3b), whereby the beads (65) and the groove shaped recesses (75) corresponding with them are configured to each other in such a manner that each store tank (3a, 3b) bears plainly with its tank bottom (60) on the abutment (6a, 6b).

30. Device according to any of the claims to 28,

characterized in

that each store tank (3a, 3b) for the binder component (A) and the hardener component (B) for centering the outlet opening (61) configured in the tank bottom (60) for the container content to the inlet openings of the supplying channels (13a, 13b) with its bottom sided peripheral marginal bead (80) or peripheral edge border can engage into a ring groove (95) corresponding with this bead and configured in the carrier plate abutment (6a, 6b), whereby the peripheral marginal bead (80) of the store tank (3a, 3b) and the ring groove (95) in the abutment (6a, 6b) are configured to each other so that the store tank (3a, 3b) plainly bears with its bottom plate (60') on the abutment (6a, 6b).

31. Method for blending a binder component and a hardener component by using a device according to any of the claims 1 to 30,
characterized in
that the binder component (A) and the hardener component (B) are supplied to a mixing chamber (14) by intercalating a metering device or by excluding a metering device, mixing chamber to which the hardener component (B) is supplied with an advance with respect to the binder component (A).

32. Method according to claim 31,
characterized in
that for the advance of the hardener comonent (B) with respect to the binder component (A) into the mixing chamber (!4) by simultaneously avoiding a further supply of hardener comonent (B) a small quantity of hardener component (B) is pressed out of the supplying channel (30a; 30b) into the mixing chamber by means of a driven piston (92), whereby the supply of the hardener compoennt (B) and of the binder component (A) takes

place after withdrawal of the piston (92) out of the supplying channel (13a; 13b).